

# Independent Study Project

India's cashless drive through demonetization  
and its impact on FinTech Landscape

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## Abbreviations

IMPS	-	IMmediate Payment Services
UPI	-	Unified Payment Interface
USSD	-	Unstructured Supplementary Service Data
SMS	-	Short Message Service
NPCI	-	National Payments Corporation of India
RBI	-	Reserve Bank of India
IBA	-	Indian Banks' Association
AEPS	-	Aadhaar Enabled Payment System
BBPS	-	Bharat Bill Payment System
BHIM	-	Bharat Interface for Money
NFS	-	National Financial Switch
VPA	-	Virtual Payment Address
NEFT	-	National Electronic Funds Transfer
RTGS	-	Real Time Gross Settlement System
IFSC	-	Indian Financial System Code
NACH	-	National Automated Clearing House
APB	-	Adhaar Payment Bridge
PFMS	-	Public Financial Management System
PPI	-	Prepaid Payment Instruments
WLA	-	White Label ATMs
MSME	-	Micro Small and Medium Enterprises
NUUP	-	National Unified USSD Platform
TReDS	-	Trade Receivables Discounting System
PRB	-	Payment Regulatory Board
API	-	Application Programming Interface
ISPIRIT	-	Indian Software Product Industry Round Table
GVA	-	Gross Value Added
CSO	-	Central Statistics Office
SBN	-	Specified Bank Notes
NBFC	-	No-Banking Financial Companies
MFI	-	Micro-Finance Institutions
PMJDY	-	Pradhan Mantri Jan Dhan Yojana



# 1. Introduction

Finance industry globally is witnessing a wave of innovation changing the way, markets conduct trade and perform financial services. From simple money transfer to complex trading systems, technology is making financial services more accessible, cheaper, innovative and efficient. Data Analytics empowered financial transactions, distributed ledger technology, P2P lending, and artificial intelligence are a few examples of such fintech revolution. Major transformations in overall financial systems, customer expectations and reduced cost of starting a FinTech venture have resulted in huge upsurge and demand for fintech startups. The sector has been growing aggressively with staggering funding from VCs, big financial institutions, and government enterprises. Since the onset of the financial crisis, investment into fintech businesses globally has increased from \$930 million in 2008 to \$22.3 billion in 2015.<sup>1</sup>

FinTech sector in emerging country like India is particularly focused on the mission of achieving financial inclusion and empowering the digital India. Historically, the vast majority of Indian financial sector assets was restricted to the banking sector by tight regulations from the central Government. However, the financial landscape is witnessing phenomenal changes with fintech startups on the rise. Lately, government regulatory authorities, banks, and fintech startups have started undergoing major transformations, and active collaborations to create new niches and opportunities. These revolutionary changes offer both an opportunity and competition to India's financial sector. The startups not only impact the supply side – changing business models for banks, driving efficiencies

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<sup>1</sup> “*FinTech in India*”, Nathan Associates, Jan’17



and outreach – but also the demand side, fundamentally achieving the objectives of financial inclusion for massive unbanked population, while changing the consumer's behavior for accessing financial services.

Indian fintech initiatives have enormous opportunities across various financial sectors such as payments and transfers, banking, personal finance, investment management, lending, cryptocurrency, crowdfunding, and insurance. ([Exhibit 2,6,9](#)) shows prominent fintech startups in India ([Exhibit 3](#)) and their dominance in different sectors ([Exhibit 2](#)). The payments sector particularly is leading within fintech, accounting for around two-thirds of investment to date.<sup>2</sup> Major global VC firms such as Softbank, tech giants such as Alibaba, Amazon, Samsung are eyeing the digital payments sector in India and making huge investments presently, as discussed in Section 5. This report focuses primarily on payments sector and explores the active role of regulatory, traditional banks and new fintech startups in shaping the industry. The report showcases the opportunities available to bridge the gap of financial inclusion and to capture massive economic gain by offering fast, reliable, digital banking services. The Indian government had demonetized its currency in Nov'16; the later sections discuss the impact of demonetization on boosting digital payments and inducing regulatory changes to facilitate digital payments. The report provides insight into the key challenges for the trio (government, banks and fintech companies) to collaborate effectively to revolutionize payments in India. It also provides insights into the future outlook for the payments in India and fintech sector overall.

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<sup>2</sup> “*FinTech in India*”, Nathan Associates, Jan'17



## 2. Payments Overview

Payments landscape is evolving globally and it is necessary to understand the current landscape and its ability to pivot to a cashless future. This section explores the evolving payments landscape globally as well as in India and the role of stakeholders (government, banks, fintech startups) in shaping this landscape.

### 2.1 Global Payments Landscape

Payments ecosystem globally is undergoing a transformational shift towards digital currency (credit cards, debit cards, mobile, digital wallets, cryptocurrency). There is a growing need for countries to move towards cashless societies relying almost completely on digital payments. Developed nations such as Sweden are leading the digital payment ecosystem with over 98% transactions happening through digital payments<sup>3</sup> while emerging countries such as Malaysia accounting for 71% transactions through digital payments<sup>4</sup>. Cryptocurrency such as Bitcoin is also gaining significant popularity since its inception in late '08. ([Exhibit 10](#)) shows information about these leading countries and their % non-cash transactions.

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<sup>3</sup><https://www.theguardian.com/business/2016/jun/04/sweden-cashless-society-cards-phone-apps-leading-europe>

<sup>4</sup><http://www.freemalaysiatoday.com/category/nation/2017/04/11/economist-malaysia-may-be-cashless-so-ciety-in-5-years/>



## 2.2 India's Payment Landscape

Historically, India has been far behind in adapting to digital currency. Over 98% of the number of transactions in India happen through cash.<sup>5</sup> India has a poor penetration of credit cards with over 28 million cards for a population of over 1.2 billion population as of Apr'18.<sup>6</sup> Banks in India offered debit cards as default with every account resulting in major prominence with over 800 million being issued so far.<sup>7</sup> However, despite high penetration, usage of debit cards is abysmally low with only 56% debit cards being activated.<sup>8</sup> Moreover, the usage of debit cards has been squarely limited to cash withdrawal from ATMs, amounting to 88% of all debit card transactions.<sup>9</sup>

Despite low plastic currency, India offers a unique opportunity for fintech boom. There are over 600 million mobile phones (feature/smart phones) and over 240 million smartphones, growing over 12% annually.<sup>10</sup> Growing penetration of smartphones especially in urban India has provided a breeding ground for digital wallets. As a result, for the past couple of years, digital wallet startups have cropped up and captured a niche market in the P2P transfers segment, catering primarily to the urban population. In a cash-loving society, digital wallets have been able to capture the market by providing value added services such as peer-to-peer money transfer, utility payments, cell phone recharges, online purchases, fuel payment at gas stations and buying movie tickets. The

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<sup>5</sup><https://www.bloomberquint.com/business/2016/11/09/the-beginning-of-the-end-of-the-parallel-economy-in-india>

<sup>6</sup> <http://www.medianama.com/2017/03/223-india-28-8m-credit-cards-818m-debit-cards-january-2017/>

<sup>7</sup> <http://www.medianama.com/2017/03/223-india-28-8m-credit-cards-818m-debit-cards-january-2017/>

<sup>8</sup><http://timesofindia.indiatimes.com/business/india-business/Of-80cr-debit-credit-cards-only-45cr-active-Jaitley/articleshow/55760493.cms>

<sup>9</sup><http://www.livemint.com/Money/jCjgdl36iBHWt30hN3gOSP/Why-cash-is-still-king-for-Indian-consumers.html>

<sup>10</sup> <https://www.statista.com/statistics/467163/forecast-of-smartphone-users-in-india/>



value of transactions generated through mobile wallet providers has grown from ₹27 billion in 2013-14 to ₹81 billion in 2014-15.<sup>11</sup> Companies like PayTM, MobiKwik, Citrus and PayU have been able to leverage the rapid increase in the use of smartphones, internet connectivity, and online shopping.

The Early success of payment startups in a number of users across country and regions, hints at a huge potential market for reaching out to a significant unbanked population in rural India. Recognizing fintech's potential to broaden the financial system, the Government of India is undertaking several initiatives for policy making such as JAM trinity<sup>12</sup>

- **Prime Minister's Jan-Dhan Yojana (PMJDY)** - Govt. initiative to provide affordable banking
- **Aadhaar** - unique biometric identification for every Indian citizen (India's SSN)
- **Mobile connectivity** - link bank account, aadhaar identity with mobile number

JAM trinity is setting the stage for digital India with a special focus on providing identification, internet connectivity, and digitization to the poorer and rural areas, making it ready for fintech revolution. A number of bank accounts opened by India due to government initiative give a clear example for India's progressing financial space. As of Apr'17, 284 million bank accounts have been opened in India under the government's PMJDY initiative, cumulatively amounting to ~\$10 billion, since its launch in Aug'14.<sup>13</sup>

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<sup>11</sup> "FinTech in India", Nathan Associates, Jan'17

<sup>12</sup> [https://en.wikipedia.org/wiki/JAM\\_Yojana](https://en.wikipedia.org/wiki/JAM_Yojana)

<sup>13</sup> <https://www.pmjdy.gov.in/account>



## 2.3 Stakeholders in payments sector

Apart from customers, there are various stakeholders involved within the payments sector - government regulators, banks, acquirers, gateways, and digital wallets. These can be broadly classified into three segments - Government, Banks and FinTech startups/non-bank entities.

### 2.3.1 Government

Indian Government holds strong control over the banking services within the country. It continues this strong control and governance through its established regulatory bodies such as the Reserve Bank of India (RBI); National Payments Corporation of India (NPCI). ([Exhibit 7.8](#)) shows various regulatory interventions undertaken by regulators in recent past to encourage and enable fintech in India.<sup>14</sup>

- **Reserve Bank of India (RBI)** - RBI is the central bank of India and controls the country's monetary policy. It plays the crucial roles of an operator, developer, catalyst, facilitator, regulator, and supervisor for financial services and banking.
- **National Payments Corporation of India (NPCI)** - NPCI was incorporated in Dec'08 as an umbrella institution for all the retail payments systems in India. The core objective of the institution is to consolidate and integrate the multiple systems with varying service levels into nation-wide uniform and standard business process for all retail payments.

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<sup>14</sup> "FinTech in India", Nathan Associates, Jan'17



### 2.3.2 Banks

Indian banking sector is dominated by public nationalized banks (SBI, the largest bank in India), followed by private banks (e.g. ICICI), recently introduced payments banks (e.g. Airtel, PayTM payments bank) and foreign banks (e.g. Deutsche Bank). Government's banking regulatory authority, Reserve Bank of India (RBI) holds strong control over the functioning of the banking sector.

### 2.3.3 FinTech startups/non-bank entities

Fintech startups are the innovation hub in finance, leveraging rapidly innovating technologies. They have cropped up across various sectors, in merchants services - payments, lending, banking; consumer payments - digital wallets, e-commerce; personal finance - lending, taxes, insurance. ([Exhibit 6,7](#)) provides info about fintech startups across sectors.

## 2.4 Payments infrastructure in India

Payments can be broadly classified into two segments - retail payments and money transfer transactions across banks. Indian Government has introduced major regulatory initiatives for both retail payments and money transfer across banks to create seamless, frictionless payments infrastructure. These initiatives have evolved with the technology, as illustrated by the examples of government's own credit card (*RuPay*) transitioning to biometric enabled payments (*AEPS*) (discussed below).

## 2.4.1 Retail Payments

Retail payments ecosystem has evolved drastically in the past decade. Various types of payment instruments have been introduced by NPCI to facilitate payments across multiple channels – bank accounts, cheques, debit and credit cards, prepaid payment instruments, etc. Following is the list of payments introduced and currently operational within India.

- **RuPay Cards** - Government's own domestic card scheme, RuPay was introduced in 2012 to reduce transaction fees as compared to MasterCard & Visa and to promote plastic currency usage among customers and merchants. Under PMJDY scheme, nearly 220 million RuPay cards have been introduced as of Apr'17.<sup>15</sup>
- **National electronic funds transfer (NEFT)** - NEFT was introduced in '05, allowing bank account holders to initiate interbank fund transfers online. There is no limit on the maximum amount of funds that can be transferred using NEFT. Under NEFT, the transactions are processed and settled in batches.
- **IMmediate Payment System (IMPS)** - Unlike NEFT, IMPS was introduced in '10 to offer an instant, 24X7, interbank electronic fund transfer service through the internet, mobile, and ATMs.
- **Real Time Gross Settlement (RTGS)** - RTGS is a Financial Market Infrastructure which processes large payments including customer payment transaction of value above ₹2 lakh.
- **Payment Banks** - In 2015, RBI took the initiative to bring private players like PayTM and FINO PayTech into the regulated financial sector as Payment Banks. Payment

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<sup>15</sup> <https://www.pmjdy.gov.in/account>



banks were introduced to reach people and small businesses who don't have access to existing banking services.<sup>16</sup> These fintech companies are set to play an established role in the digital payments space and provide a platform to build partnerships with other players and deliver a broader range of financial services (e.g. loans, insurance).

## 2.4.2 Money Transfers

There are various systems to meet the remittance requirements of users depending upon the time criticality and cost sensitivity – NEFT, IMPS, Aadhaar Enabled Payment System (AEPS) and recently introduced Unified Payments Interface (UPI). The need for making bulk and repetitive payments is met by systems such as National Automated Clearing House (NACH), Electronic Clearing Service (ECS) and Aadhaar Payment Bridge System (APBS) (in the pipeline, discussed later).

- **National Automated Clearing House (NACH)** - NPCI implemented NACH for banks, financial institutions, corporates and the government. NACH is a web based solution to facilitate interbank, high volume, electronic transactions which are repetitive and periodic in nature. NACH System is used for making bulk transactions towards the distribution of subsidies, dividends, interest, salary, pension etc. and also for bulk transactions towards the collection of payments pertaining to telephone, electricity, water, loans, investments in mutual funds, insurance premium etc.
- **Electronic Clearing Service (ECS)** - ECS is an electronic mode of funds transfer from one bank account to another. It can be used by institutions for making payments such as the distribution of dividend interest, salary, pension etc. It can also be used

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<sup>16</sup><http://www.livemint.com/Industry/hbMzVQS2vsFFkgEdHrQ1GI/Mor-panel-proposes-payments-banks-to-spread-financial-incl.html>



to pay bills and other utilities such as telephone, electricity, or for making monthly installments payments on loans.

- **Cheque Truncation System (CTS)** - CTS is the process that removes the need to move physical instruments across bank branches. This reduces the time required for money collection and brings uniformity to the entire activity of cheque processing.

## 2.5 Digital payment initiatives recently introduced or in pipeline

Despite appalling performance for card payments, India has been ahead of many countries including few developed nations, in leapfrogging plastic currency and adopting mobile & biometric enabled payments. India has introduced key protocols to facilitate efficient secure digital payments and transformation towards a cashless society.

### 2.5.1 Unified Payments Interface (UPI)

UPI is the latest protocol introduced in Apr'16, to facilitate net banking transfer for the **mobile-first** generation. It is a real-time money transfer solely using a mobile number and a username-VPA<sup>17</sup>. UPI is an interoperable system merging several banking features, seamless fund routing, and merchant payments into one hood. It provides complete consumer privacy concealing bank info; caters to *peer-to-peer* transfers and merchants payments supporting both send-request features and push-pull payment alternative.

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<sup>17</sup> VPA - Virtual Private Address

### 2.5.2 Unstructured Supplementary Service Data (USSD)

USSD service provides digital payments for feature phone users, especially targeting internet-limited rural population relying on mobile SMS. It brings together all the diverse ecosystem partners such as banks & telecom service providers; allows customers to access financial services by dialing \*99# from their registered mobile number.

### 2.5.3 BharatQR Code

The Government introduced BharatQR payment system in partnership with Mastercard, and Visa in Mar'17, to build first of its kind fully interoperable, low-cost, mobile based acceptance solution. This provides a seamless experience to consumers by simply scanning the merchant's QR code using mobile and make cashless payments, further accelerating India's transition to a cashless society.<sup>18</sup>

### 2.5.4 Aadhaar Enabled Payments System (AEPS)

AEPS is the newest payment system which is currently under development. It facilitates digital payments from Aadhaar seeded bank accounts using biometric authentication of customers. Replacing Point-of-sales systems with AEPS will remove the friction of using phones, cards, cash; as instead customer's biometric authentication would be used to transfer payments directly from customer's to merchant's account.

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<sup>18</sup>[http://economictimes.indiatimes.com/articleshow/57256004.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](http://economictimes.indiatimes.com/articleshow/57256004.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)



### 2.5.5 Aadhaar Payment Bridge System (APBS)

The Government has been developing APBS to help govt agencies realize the Direct Benefit Transfer scheme. It is designed to successfully channelize government subsidies and benefits directly to intended beneficiaries' bank accounts using their Aadhaar info.

### 2.5.6 Bharat Bill Payment System (BBPS)

BBPS was established as a central unit in 2016, to offer a uniform bill payment system in the country. It operates under a well-defined set of standards, provides a common platform for users with experience in bill payments and supports all forms of electronic payments. NPCI will also undertake clearing and settlement activities related to transactions routed through BBPS.

### 3. Repercussions of Demonetization

On Nov 8, 2016, the Indian government took an unprecedented move and decided to demonetise all high-value currency notes of the denomination of ₹1,000 and ₹500. Such notes, valued at ₹15.4 trillion, constituted 86.9 percent of the value of the total currency in circulation.<sup>19</sup> The decision was aimed at eliminating corruption, black money, tax evasion, counterfeit currency and terror funding. India is a country with a huge dependency on cash, as over 98% of the transactions are cash based.<sup>20</sup> Demonetization is expected to have had an enormous long-term impact on the cash dependent economy. Dip in liquidity significantly impacted the employment and informal economy (over 90% of labor force is employed in informal economy). GDP forecast was reduced by 0.5% IMF due to short-term growth impact.<sup>21</sup>

#### 3.1 Impact of Demonetization on FinTech sector

Though the decision was aimed at reducing corruption, it had far-reaching consequences for payments ecosystem and triggered the digitization of the Indian economy. While it is early to determine the full effects of demonetization, there is little doubt that the policy has provided a unique opportunity to Indian fintech startups to dramatically increase the uptake of digital financial services among Indian consumers and businesses.

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<sup>19</sup> Reserve Bank of India, “*Macroeconomic impact of demonetization - a preliminary assessment*”, 10<sup>th</sup> Mar’17.

<sup>20</sup><https://www.bloombergquint.com/business/2016/11/09/the-beginning-of-the-end-of-the-parallel-economy-in-india>

<sup>21</sup><http://www.imf.org/en/News/Articles/2017/02/21/NA022217-For-India-strong-growth-persists-despite-new-challenges>

### 3.1.1 Increase in liquidity and bank accounts

Government's demonetization move has led to a significant surge in deposits and financial savings and has further empowered greater formalization of the economy, creating a large surplus liquidity. Moreover, combined with Government's initiative, PMJDY has resulted in increasing bank accounts for traditionally unbanked population. As of Apr'17, 284 million bank accounts have been opened in India under the initiative, cumulatively amounting to ~\$10 billion, since its launch in Aug'14.<sup>22</sup>

### 3.1.2 Upsurge in digital payments

Depriving consumers of cash currency provided an unprecedented push for consumers to utilize payment alternatives such as mobile wallets ( e.g. PayTM, Mobikwik). Post demonetization Paytm added 20 million new customers<sup>23</sup> and registered over 7 Million transactions that are worth of an average of ₹1.2 billion on a daily basis.<sup>24</sup> During the last quarter of 2016 overlapping partially with demonetization period, online payment acquirer, Chillr's transactions grew four-fold and crossed ₹5 billion mark in Jan'17 - over 10-fold increase in the last 1 year.<sup>25</sup>

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<sup>22</sup> <https://www.pmjdy.gov.in/account>

<sup>23</sup> <https://www.bloombergquint.com/business/2017/01/16/after-demonetisation-payments-bank-the-next-big-push-for-paytm>

<sup>24</sup> <http://last-news24.com/paytm-gets-upi-support-resulting-in-easy-money-transfer/>

<sup>25</sup> <http://indread.com/53564/mobile-payment-platform-chillr-to-launch-upi>

### 3.1.3 Government's foray into mobile payments app

To push the initiatives for digital payments and ease down the impact of demonetization, Indian Government decided to launch mobile apps leveraging its recently introduced payment protocols.

- **BHIM** - During demonetization, Government launched a mobile app, *BHIM* to facilitate real-time money transfers using UPI, linking directly to the bank account, unlike digital wallets. Early reception for the app can be judged from the fact that within 10 days of its launch, over 10 million users downloaded, making it most popular app during demonetization.<sup>26</sup> BHIM app has also been integrated with recently introduced BharatQR to provide wider reach.
- **Aadhaar Pay** - Aadhaar Pay is the soon-to-be-launched mobile app from Government built over AEPS system (discussed in section 2.5.4). It will provide merchants easy access to accept payments through biometric authorization from consumers who do not have debit cards, mobile wallets, and mobile phones.

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<sup>26</sup> <https://upipayments.co.in/bhim-app-download-features-use/>



## 4. Opportunities & challenges

Indian payments landscape offers a plethora of opportunities for key stakeholders - Government, Banks and FinTech ventures. However, to leverage such opportunity it is necessary to understand the factors driving the opportunity, and the challenges associated.

### 4.1 Factors driving unique fintech opportunity

Due to limited adoption of plastic currency, there exists a unique opportunity to directly move to mobile payments. The following are multiple reasons responsible for India's limited adoption of plastic currency.

#### 4.1.1 Payments ecosystem dominated by cash transactions

Over 80% transactions are currently occurring through cash transactions. However, in efforts to control shadow economy, black money and tax evasion, Government is heavily limiting big ticket transactions. This has grown the need for digital payments.

#### 4.1.2 Massive unbanked population

Around 21 percent of the world's unbanked adult population is in India.<sup>27</sup> Thus, India has a massive need for financial inclusion and provides an excellent opportunity for fintech companies. Today's competition majorly serves the wealthier urban crowd. Formal banking institutions have limited reach in rural and remote areas with a limited offering for financial products. This offers a huge pool of prospective customers with currently little or no access to financial services that fintech companies can tap into.

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<sup>27</sup> Nathan Associates, "FinTech in India", Jan'17

### 4.1.3 Fastest growing mobile phone users

India has world's 2<sup>nd</sup> largest mobile users base consisting of over 616 million mobile phone users and 275 million smartphone users as of June'16.<sup>28</sup> Underutilized and rapidly expanding the internet and mobile penetration, emergence of a younger, wealthier and digital-savvy generation and the existence of large gaps and inefficiencies in the financial sector - clear indicators for heavy demand for fintech in near future.

### 4.1.4 Limited digital transactions in retail, lack of Point-of-sale system

India has merely about 1.5 million Point Of Sale (POS) terminals in comparison to over 10 million merchants in India.<sup>29</sup> However, in comparison to the 800 million credit & debit cards<sup>30</sup> that have been issued as of now, the number of POS terminals in the country have been inadequate. Among other factors, the high Capex and Opex associated with traditional POS terminals, have been the major deterrents to the expansion of POS infrastructure. Offline retail offers a lucrative opportunity for digital transactions. Moreover, proper transaction history will provide better financial history and cash flow management. Such limited access to funds is the second most cited hurdle for businesses and in India, almost 90% of small businesses do not have access to financial institutions.<sup>17</sup>

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<sup>28</sup> GSMA Intelligence, "The Mobile Economy India 2016," Oct 26, 2016

<sup>29</sup><https://rbidocs.rbi.org.in/rdocs/Speeches/PDFs/TPS200220178840E4166A124CF0BEE827EFC85E4A25.PDF>

<sup>30</sup> <http://www.medianama.com/2017/03/223-india-28-8m-credit-cards-818m-debit-cards-january-2017/>



## 4.2 Challenges to overcome for financial institutions and fintech startups

With all three stakeholders offering their own payments mobile app, there is growing overlap and conflict of interests. There are multiple challenges in migrating a significant population from cash transactions to electronic financial inclusion and financial literacy.

### 4.2.1 Lack of documentation and information asymmetry

Financial inclusion remains hindered by factors such as insufficient documentation, lack of collateral and financial history. The opportunity for tech-based solutions to reduce transaction costs and information asymmetries is enormous and should support a rapid increase in financial inclusion for India's poorer populations.<sup>31</sup>

### 4.2.2 Lack of trust

Limited documentation results in harassment of consumers by banking and regulatory authorities. This results in limited trust of consumers in financial institutions giving rise to the reliance of cash payments, lack of credit availability and exploitation by unregulated lenders such as zamindars<sup>32</sup>. Financial inclusion remains hindered by factors such as insufficient documentation, lack of proper identification, paperwork.

### 4.2.3 Financial illiteracy

India's literacy rate (74%) is lower than the world average of 86%<sup>33</sup>, resulting in poor understanding of financial institutions limiting banking opportunities.

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<sup>31</sup> "*FinTech in India*", Nathan Associates, Jan'17

<sup>32</sup> <https://en.wikipedia.org/wiki/Zamindar>

<sup>33</sup> [https://en.wikipedia.org/wiki/Literacy\\_in\\_India](https://en.wikipedia.org/wiki/Literacy_in_India)



## 5. Global perspective

### 5.1 Global agencies outlook for India's demonetization

World Bank in its report titled 'South Asia Economic Focus - Globalisation Backlash', agreed with the Indian Government's demonetization act for curbing corruption and black money. According to the World Bank, notes ban will have a positive developmental impact in the long term as it would accelerate financial deepening, foster financial inclusion and increase transparency. But for this to happen, there should be a large and durable shift from cash to electronic payment methods.<sup>34</sup>

India remains one of the fastest growing emerging market economies. India's overall outlook remains positive, although growth will slow temporarily as a result of disruptions to consumption and business activity from the recent withdrawal of high-denomination banknotes from circulation. IMF in its latest growth forecast reduced India's expected growth rate to 6.6% instead of over 7% pre-demonetization.<sup>35</sup>

Maintaining the reform momentum is key to stronger growth. IMF expects India's expansion will pick up again as soon as the economic reforms would kick in. The government has made significant progress on important economic reforms; these reforms will further support strong and sustainable growth going forward. In particular, the upcoming implementation of the goods and services tax, which has been in the making for over a decade, will help raise India's medium-term growth to above 8 percent, as it will

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<sup>34</sup><http://timesofindia.indiatimes.com/india/note-ban-will-have-positive-impact-in-long-term-world-bank/articleshow/58228663.cms?from=mdr>

<sup>35</sup><http://www.imf.org/en/News/Articles/2017/02/21/NA022217-For-India-strong-growth-persists-despite-new-challenges>



enhance the efficiency of production and movement of goods and services across Indian states.<sup>36</sup>

The demonetization initiative presents an opportunity to increase the size of the formal economy and broaden financial intermediation in the longer term. It can also support a widening of the tax base, help reduce the fiscal deficit, enhance bank liquidity, and give a push to the government's efforts to promote greater financial inclusion. Global agencies also expect important progress to be pursued with better targeting and greater efficiency of subsidy and social spending programs through the greater use of the trio of Aadhaar unique beneficiary identification, direct benefit transfers, and information technology.

## 5.2 Need for global VC investments

Fintech ecosystem in India has a strong potential for success and offers great growth opportunity. However, there is a dire need for capital since the VC investments in the industry are limited. While there are a few investors looking at the sector, there is a lack of high-quality investors with the knowledge and expertise to add significant value through mentorship and advisory services. Industry coordination is also weak.<sup>37</sup> This provides a lucrative opportunity for global investors to invest in high potential fintech companies. Currently, global investment in Indian fintech companies is led by the single \$500 million investment from Alibaba in PayTM.<sup>38</sup>

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<sup>36</sup><http://www.imf.org/en/News/Articles/2017/02/21/NA022217-For-India-strong-growth-persists-despite-new-challenges>

<sup>37</sup> "FinTech in India", Nathan Associates, Jan'17

<sup>38</sup> "FinTech in India", Nathan Associates, Jan'17

### 5.3 Global tech companies introducing digital solution for Indian ecosystem

Global tech companies have been proactively looking for lucrative opportunity to enter Indian landscape. However, with localized regulations and standards, it is necessary for global fintech firms to offer customized solutions for Indian population. Samsung took a lead in Mar'17 to introduce Samsung Pay in India. Apart from its native solution of facilitating users with its simply tap and pay on the go services using their registered cards, Samsung Pay, also integrated local digital wallet, Paytm and government's UPI with the application. It has been able to contribute towards Digital India with tailored products and services, customized to meet the needs of Indian consumers.<sup>39</sup>

Multiple global firms have announced initiatives to introduce digital payment solutions in India. Tencent and Foxconn backed Hike Messenger has announced to introduce UPI-based payments.<sup>40</sup> WhatsApp to foray into digital payment system by integrating UPI payments to the app.<sup>41</sup> Truecaller, the pioneer in the caller ID service has partnered with ICICI Bank and integrated the UPI-based payments service with which users can send and receive money from other users.<sup>42</sup> In Apr'17, Amazon received a wallet license in India, allowing flexibility to Amazon Pay, which was introduced in Dec'16.<sup>43</sup> Paypal, WeChat, and Alipay are also looking for an opportunity to introduce their payment products compatible with the Indian Payments ecosystem.

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<sup>39</sup><http://www.moneycontrol.com/news/business/companies/samsung-launches-mobile-payment-service-in-india-2244953.html>

<sup>40</sup> <https://telecomtalk.info/hike-messenger-upi/162676/>

<sup>41</sup> <https://telecomtalk.info/whatsapp-upi-payments-app/162165/>

<sup>42</sup> <https://telecomtalk.info/icici-bank-truecaller-mobile-payment-service/161923/>

<sup>43</sup> <http://www.medianama.com/2017/04/223-amazon-wallet-license-india/>



### 5.3.1 Partnership with banking infrastructure

For global companies, it is necessary for them to partner with local financial institutions to facilitate their operational procedures of onboarding, credit-line assessment, dispersal, and collection, to abide by local regulations and restrictions. Samsung Pay has partnered with a number of issuers and card networks, including Visa, MasterCard, Axis Bank, HDFC Bank, ICICI Bank, SBI Card and Standard Chartered Bank.<sup>44</sup>

### 5.3.2 Discounts and Cashback

Indians are highly price conscious customers driven extensively by discounts and cashback offers provided by digital wallets such as PayTM and Mobikwik. To make Samsung Pay successful, it has launched exclusive offers for users such as 20% instant discount on Pizza Hut orders for Mastercard users, Axis Bank users can get up to ₹1,000 cashback; Paytm digital wallet users get up to 100% cashback on movie tickets and similar offers for other wallets.<sup>45</sup>

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<sup>44</sup><http://www.moneycontrol.com/news/business/companies/samsung-launches-mobile-payment-service-in-india-2244953.html>

<sup>45</sup><http://gadgets.ndtv.com/apps/news/samsung-pay-mobile-payment-platform-launched-in-india-upi-integration-announced-1672195>



## 6. Future Outlook

The future of digital payments is more critically dependent upon the execution of initiatives than their launch. Indian Government has made major progress in introducing regulatory reforms in past couple of years. However, the real litmus test of the digital initiatives depend upon the long-term success. To achieve long-term success it is necessary to determine the role and responsibilities of each stakeholder. Awareness of pitfalls will also be critical to bridge the gap between the financial institutions and the consumers.

### 6.1 Need for triangular partnership between Government, Banks, FinTech

To achieve financial inclusion while providing sustainable financial services to all masses, it is critical for all the stakeholders - Government, traditional Banks, and fintech startups to form strategic partnership. Each of them have a crucial role to play and any lopsided growth may be catastrophic for future of cashless payments.

### 6.2 Government

Government regulatory authorities like RBI play a catalytic and facilitating role for enabling innovations in payment systems, while being responsible as a regulator and supervisor. There are multiple approaches that Government can undertake to fuel fintech innovation.

#### 6.2.1 Pro-active, balanced approach, and involvement of fintech firms in drafting regulations

Government's approach to regulation of fintech has been largely reactive. Government regulators need to pro-actively create a conducive environment for fintech



by involving various stakeholders in early stages of drafting regulations. It needs to incorporate necessary regulatory changes, while providing balanced environment such as tax reforms, ease of doing business. Simplified regulatory processes, removal of structural hurdles, and balanced regulations are necessary to safeguard the interests of companies and customers, and to influence the future of fintech, particularly in the context of financial inclusion.

### 6.2.2 India Stack - introduction of paperless standards

A set of APIs under India Stack were launched by the Government in the recent past, building nationwide digital ecosystem to facilitate a presence less (without physical presence), paperless, and digital consent layer.<sup>46</sup> Government needs to promote startups/banks/services industries to start leveraging APIs to leverage faster digital ecosystem for user authentication, payments, paperwork, and consent.

**eKYC** - Aadhaar eKYC is a paperless Know Your Customer (KYC) process, wherein the Identity and Address of the subscriber are verified electronically through Aadhaar Authentication.

**eSign** - eSign service allows applications to replace manual paper based signatures by integrating an API which allows an Aadhaar holder to electronically sign a form/document anytime, anywhere, and on any device legally in India.

**DigitalLocker** - Digital Locker is a platform for issuance and verification of documents & certificates in a digital way, thus eliminating the use of physical documents. It is cloud storage space like Dropbox for Indian citizens linked to their Aadhaar (UIDAI) number.

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<sup>46</sup> <https://indiastack.org/about/>

### 6.2.3 Adding more bank and non-bank entities in financial ecosystem

India's regulatory structure has traditionally favoured banks over non-bank entities. However, to penetrate fully within country, providing financial services to all, it is necessary for Government to open up its financial system to private players. This will revolutionize payments sector similar to telecom boom within country. Since 2015, India has started granting licences or registrations for payment banks and digital wallets. In Mar'17, Amazon received digital wallet license in India. The sector needs to be freed of the licensing mechanism and more number of entities, meeting minimum criteria, should be allowed to function.

*“ Currently, marginalized population has very low trust in banking due to the harassment by the bank officials because of poor documentation, lack of identity proofs, and low credibility. Government's initiative of India stack (DigitalLocker, eKYC) will help building infrastructure providing reliable identity to the population and improving inclusion of marginalized population in mainstream society. ”*

*- Mayank Mathur, Assistant Vice-President, Aye Finance Pvt. Ltd, micro-finance startup in India*

## 6.3 Stakeholder#2 - Traditional Banks

In order to succeed, traditional banks need to adopt agility from fintech startups and change their closed structure.

### 6.3.1 Opening up APIs

To collaborate and solve problems effectively, it is necessary for banks to standardize and open up their APIs to fintech companies. This will allow easy collaboration, quick time to market and innovative products utilizing the customer data.



### 6.3.2 Partnering with fintech startups

Incumbent banks have large customer bases, vast majority of assets and close links to the government. Fintech companies will struggle to capture significant market and will focus primarily on filling the gaps in the financial sector. By partnering with fintech startups banks will be able to fill gaps in the market, drive efficiencies and collaborate through innovative B2B models in the financial sector. While fintech startups can be nimble, customer-centric and innovative, incumbent banks can provide capital, data and customer relationships. These relationships and synergies will be key to the future growth and development of Indian fintech. Recent study shows that nearly 60% of the financial institutions are seeking partnerships with FinTechs globally (60.0%)<sup>47</sup>.

### 6.3.3 Challenge fund

A fintech challenge fund such as Citi Venture can be built to promote innovation and scaling of new business concepts supporting objectives of financial inclusion and digitization of currency.

## 6.4 Stakeholder#3 - FinTech companies

Fintech companies can leverage their technical prowess, agility and risk-taking appetite to build smarter and efficient solutions.

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<sup>47</sup> “World FinTech Report 2017”, Capgemini



### 6.4.1 Mobile based payment solutions

With increasing number of payment solutions being integrated through the mobile channel, fintech companies can provide simpler, user-friendly mobile applications facilitating different aspects of payments, authentication, paperwork, authorization, and confirmation. Digital wallets, QR code based payment systems, and m-POS are all positioned to provide added services using smartphones building on fintech expertise.

### 6.4.2 Cross-functional expertise

Fintech companies have cross-functional expertise ranging from legal, social media, consumers psychology, infrastructure and technology, helping develop holistic solutions with ease of usage and effectiveness.

## 6.5 Factors responsible for effective partnership among stakeholders

To build effective partnership among all the stakeholders - Government, Banks, and fintech startups, building ecosystem and incentives alignment is necessary.

### 6.5.1 Omnichannel, interoperable, cost-effective, and fast payments experience

All players should continue investing in building interoperable banking infrastructure implementing omnichannel experience and providing seamless digital payments across platforms. Ecosystem need to support multiple access channels (mobile, net banking, ATM, branch, IVR, BC, etc) or mobile banking/payments, cheque clearing or card payments to support cashless society.

### 6.5.2 Incentive alignment for banks and merchants

Regulatory authorities should help align the interests of all stakeholders by mandating installations of POS terminals and mobile payments, and by rationalising Merchant Discount Rate to reduce cost on merchants' pocket. While almost every bank is a card issuer, very few banks are engaged in merchant acquiring and card acceptance infrastructure setting up activities. There is high concentration for acquiring business. Roughly top 5 acquirer banks account for nearly 81% of POS infrastructure and top 10 acquirers' possess POS share greater than 90%.<sup>48</sup> High cost of acquiring businesses, low utilization of cards, lack of incentive for merchants to accept card payments and high Merchant Discount Rate (MDR) have resulted in limited growth for card acceptance.

### 6.5.3 Starting new incubation centers, partnering academia and industry

India has a strong talent pool and innovative ecosystem that can support high fintech growth. However, lack of incubation facilities for early stage fintech ideas limits the opportunities. To build an effective ecosystem it is necessary to strengthen linkages between industry, regulators and academia to create a strong pipeline of ideas by higher proportion of R&D investment from all stakeholders.

### 6.5.4 Tax Rebate for digital transactions

Tax evasion is one of the leading reasons for shadow economy and corruption within India. Merchants and consumers are least interested in using digital currency and providing paper trail to the govt authorities for tracking misconduct. Government

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<sup>48</sup><http://www.medianama.com/2016/03/223-rbi-concept-paper-looks-to-boost-card-payments-at-pos-terminals-in-the-country/>



needs to extend tax rebates for digital transactions, compensating merchants for the tax loss especially in low margin businesses such as gas stations, groceries.

### 6.5.5 Cash Back / rewards for transacting through mobile

Incentivizing consumers for credit card transactions through cashbacks is utilized typically by credit card companies. However, low penetration of the credit cards in India has been ineffective in incentivizing consumers and rewarding merchants. Government, banks, and fintech companies need to incentivize merchants and consumers in short run for using digital transactions over cash. Indian Government launched *Digi Dhan Yojana*<sup>49</sup>, Lottery scheme in Jan'17 to reward a lucky merchant and consumer, daily and weekly to embrace digital transactions using recently introduced UPI-BHIM initiatives.

*“ Government has started incentives to promote card transactions as India has over 800 million debit cards.<sup>50</sup> Merchant Discount Rate (MDR) and surcharge on card transactions has been reduced significantly. Fuel and utility companies are subsidizing the transaction costs in gas stations and utility payments. Government has also capped MDR on debit cards and nominal charges have been passed to the merchants. ”*

*- Vijay Jasuja, CEO, SBI Cards*

## 6.6 Pitfalls in fintech to be addressed by regulators, financial institutions and firms

### 6.6.1 Cyber security

Cyber security is the key concern among cash reliant population; it is necessary for regulators and firms to collaborate and build secured applications. Without constant attention, cyber crimes have the potential to diminish consumer's trust in e-payments.

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<sup>49</sup> <https://digidhanlucky.mygov.in/>

<sup>50</sup> <http://www.medianama.com/2017/03/223-india-28-8m-credit-cards-818m-debit-cards-january-2017/>



India has made regulatory changes over the last 3-4 years to ensure safety and security and needs to continue such efforts. Some of these measures such as - SMS alerts, two factor authentication for online transactions with dynamic passwords OTPs, mandated phased out migration to EMV chip and PIN cards, have successfully deterred fraud.

### 6.6.2 Cyber Frauds

Despite Government's efforts to safeguard consumers against cyber attacks through security measures, there have been an increasing number of fraudsters attacks luring less-aware customers to reveal their confidential bank account/card details. Especially new Government backed standards such as UPI are vulnerable to attacks, that can derail government initiatives for cashless system. In Dec'16, Bank of Maharashtra was duped by fraudsters for a loss of ₹61.4 million exploiting a bug with the bank's recently introduced UPI application<sup>51</sup>. To gain consumers trust, NPCI has assured nil vulnerability in BHIM and other digital windows launched by the government.<sup>52</sup> Mobile security startup, Appknox recently identified several critical vulnerabilities in UPI based mobile applications developed by banks and other fintech companies. These vulnerabilities had the potential of exposing user's entire bank details to any hacker.<sup>53</sup> All stakeholders need to watch out for these attacks and build a firewall around the payments systems.

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<sup>51</sup> <http://www.medianama.com/2017/03/223-bank-maharashtra-upi/>

<sup>52</sup> [http://www.indiaonline.com/article/news-top-story/unified-payments-interface-upi-and-bhim-are-not-vulnerable-npci-117032100232\\_1.html](http://www.indiaonline.com/article/news-top-story/unified-payments-interface-upi-and-bhim-are-not-vulnerable-npci-117032100232_1.html)

<sup>53</sup> <http://economictimes.indiatimes.com/small-biz/startups/this-startup-identified-multiple-ways-a-hacker-can-access-your-information-via-a-upi-based-app/articleshow/57681825.cms>

### 6.6.3 Lack of financial awareness

With high prevalence of illiteracy and limited awareness about technical processes, the greatest tool to fight the menace of frauds is 'to build customer awareness'. This is particularly important to ensure that the digital divide in payments doesn't further widen gap between rural and urban crowds. By building awareness fintech startups and banks have an opportunity to tap into massively untapped customer base.

### 6.6.4 Customer protection

With advent of digital payments there are multiple stakeholders involved with the transactions. It makes consumer protection, privacy, customer service and efficiency in dealing with customer complaints and grievances highly crucial. Government regulators need to define protocols related to user rights, privacy, and protection. Fintech companies need to offer more secure payment infrastructure to consumers in order to build their trust in the digital ecosystem.

*“ Despite lucrative opportunities in fintech sector, India is plagued with major challenges due to the regulatory uncertainty. Government regulations change quickly and aren't stable. Government's move of retroactively changing tax laws during Vodafone - Hutchison merger in 2007<sup>54</sup> took a huge beating for investors' trust. Stable tax regime is also missing and GST bill execution has lot of uncertainties despite its pending launch in July'17. India is missing lending regulation framework making it difficult for credit extension to startups. Moreover, due diligence is highly subjective and proper guidelines need to be framed. ”*

**- Tarun Bansal, Senior Analyst - FinTech sector, Tracxn**

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<sup>54</sup> [https://en.wikipedia.org/wiki/Vodafone\\_India#Vodafone-Hutchison\\_tax\\_case](https://en.wikipedia.org/wiki/Vodafone_India#Vodafone-Hutchison_tax_case)



## 7. Possible outcomes for the Indian payment ecosystem

Based on the initiatives taken and consumer adoption, the future of the Indian payment can progress towards three paths. This section address these three possibilities in detail:

### Scenario#1 – Digital payments initiatives highly Successful

- New global entrants such as Whatsapp, Amazon, WeChat, Square enter and promote digital payments especially mobile based example UPI.
- High consumer penetration with easy integration.
- Banks actively partnering with fintech to promote their financial services with easier customer acquisition, engagement while building trust among users.
- Government introduces reform bills such as GST, reduces complexities and paperwork, bureaucracy, helps ease of starting and doing a business.
- Actively promotes digital transactions among masses and improves awareness about the digital payments.
- Goes beyond its milestone of 25 billion transactions in 2017.
- Transactions increase as % cash transactions.
- Increased PoS adoption among merchants.
- Debit cards become mainstream outside ATMs.
- Stronger control over large ticket cash transactions.
- India stack services seamlessly integrates with new startups to reduce friction in payments.



## Scenario#2 – Digital payments initiatives achieve average results

- Limited fintech and digital payments growth.
- Major banks and fintech companies partnering to capture urban population through card and smartphone transactions.
- Overall digital transactions observe 10-30% yoy growth.
- Government introduces reform bills (GST) but ease of business remains challenged.
- UPI is supported as an additional digital payment alternative.
- P2P transactions drive significant usage.
- Merchants still relying on MDR (Merchant Discount Rate) subsidy from government.

## Scenario#3 – Digital payments initiatives fizzles out and achieve limited objectives

- Lopsided growth – Government initiative fizzles out.
- Post remonetization cash remains the preferred choice of payment and digital transactions decline to pre-demonetization numbers.
- UPI switching cost limits its usage to early adopters.
- Aadhaar Pay is utilized for government benefits transfer schemes but finds highly limited usage in businesses/industry.
- Financial illiteracy, lack of trust on digital currency, cyber threats, and complexity make users skeptical of digital payments.
- Lack of focus - 2019 elections deflects the focus of the government on pushing the initiatives through much needed execution phase.
- Cannibalization threat to existing wallet firms results in firms building their respective closed systems such as Venmo, defeating interoperability and scalability.

## 8. Few words from Industry experts

To get a better perspective about the industry outlook, CEO, traditional bank division, a senior fintech sector analyst, and AVP fintech startup were interviewed.

**Vijay Jasuja, CEO, SBI Cards, India's largest bank, SBI in joint venture with GE Capital**

*"Government's demonetization move provided significant push to the digital transactions through credit/debit cards and mobile payments (digital wallets, BHIM, UPI). However, with recovery of cash in the economy, digital transactions have declined since its peak in Dec'16. 60-70% of digital transactions have went back to cash based transactions. Government's recently introduced steps to limit amount of each cash transaction to ₹200,000 has helped in moving big ticket transactions for real-estate and jewelry to digital transactions."*

*"Government has started incentives to promote card transactions as India has over 800 million debit cards.<sup>55</sup> Merchant Discount Rate (MDR) and surcharge on card transactions has been reduced significantly. Fuel and utility companies are subsidizing the transaction costs in gas stations and utility payments. Government has also capped MDR on debit cards and nominal charges have been passed to the merchants."*

**Tarun Bansal, Senior Analyst - FinTech sector, Tracxn, firm tracking early-stage fintech startups in India**

*"Lending is necessary for the growth of payments and insurance, as credit availability creates value in the society. However, credit availability penetration in India is extremely low (8-10%) v/s ~80% in US. Banks are unable to extend loans due to poor documentation, limited digital footprint for the population, small ticket loans and high servicing cost. FinTech companies are exploring creative ways of measuring credit of the borrower using mobile history with limited or no financial and tax history. Government's digital initiative such as eKYC is able to reduce the customer acquisition cost by 10X from ₹1,100 → ₹100, creating economically sustainable and scalable lending business for banks and fintech companies."*

*"Despite lucrative opportunities in fintech sector, India is plagued with major challenges due to regulatory uncertainty. Government regulations changes quickly and aren't stable. Government's move of*

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<sup>55</sup> <http://www.medianama.com/2017/03/223-india-28-8m-credit-cards-818m-debit-cards-january-2017/>



*retroactively changing tax rules during Vodafone - Hutchison merger in 2007<sup>56</sup> took a huge beating for investors' trust. Stable tax regime is also missing and GST bill execution has lot of uncertainties despite its pending launch in July'17. India is missing lending regulation framework making it difficult for credit extension to startups. Moreover, due diligence is highly subjective and proper guidelines need to be framed."*

**Mayank Mathur, Assistant Vice-President, Aye Finance Pvt. Ltd, Global VCs backed**  
*Micro-finance startup catering to small sized businesses in India*

*"Government's focus has been primarily on the payments sector and the initiatives for digital India and cashless society. However, the success of the initiatives heavily depend upon the agility of the government to drive efforts. It needs to lessen bureaucracy and ensure the focus on its single point agenda of digital India. Currently, marginalized population has very low trust in banking due to the harassment by the bank officials because of poor documentation, lack of identity proofs, and low credibility. Government's initiative of India stack (DigitalLocker, eKYC) will help building infrastructure providing reliable identity to the population and improving inclusion of marginalized population in mainstream society."*

*"It will be crucial for Government to provide support to lending sector especially micro-finance as it serves financial inclusion as well as growth of underserved population. Currently, banks provide money to micro-finance firms at very high interest rate as banks consider micro-finance as unsecured risky loan. However, small borrowers served by microfinance firms such as Aye-Finance are highly reliable with default rate less than 1%. Government can support industry by providing ease of lending by initiatives to provide credit guarantee to micro-finance startups, more assurance to banks, helping microfinance firms raise money from banks at lower rate. This in return will help micro-financing firms to pass the benefits of lower rate to the consumers. This will help in better achieve the objective of pushing economic growth while achieving financial inclusion faster."*

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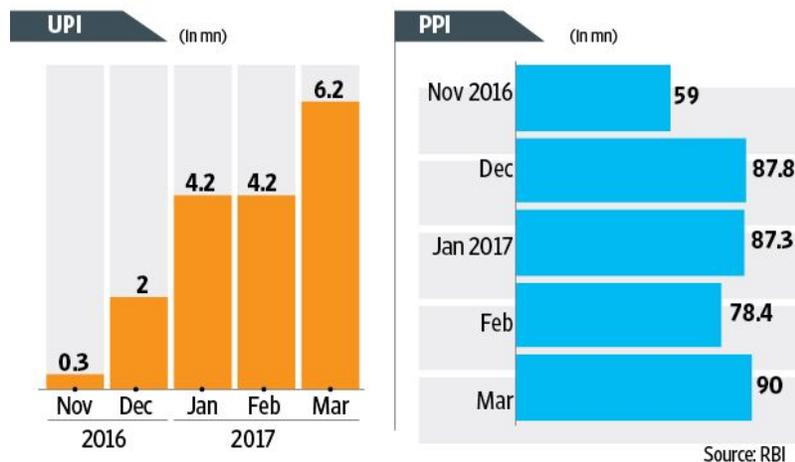
<sup>56</sup> [https://en.wikipedia.org/wiki/Vodafone\\_India#Vodafone-Hutchison\\_tax\\_case](https://en.wikipedia.org/wiki/Vodafone_India#Vodafone-Hutchison_tax_case)

## Exhibits

### Exhibit 1 - Transactions distribution across various payment mediums <sup>57,58</sup>

#### DIGITAL PAYMENTS HIT NEW HIGH

Digital transactions through the Unified Payments Interface (UPI) and prepaid payment Instruments (PPIs) such as mobile wallets have reached a new peak even as remonetization accelerates. The government is encouraging digital payments to move India towards a less-cash economy.



#### Representative data (Updated as on February 1, 2017)

Segments	Volume (mn)	Change (%)	Value (₹ cr)	Change (%)
	Jan '17	over Dec '16	Jan '17	over Dec '16
Real-time gross settlement	9.3	5.5	77,48,607	-7.9
National electronic funds transfer	164.2	-1.3	11,35,508	-1.6
Cheque truncation system	118.5	-8.9	6,42,420	-5.7
Immediate payment service	62.4	18.3	49,120	13.7
National automated clearing house	158.7	-20.1	54,140	-13.6
Unified Payments Interface	4.2	111.4	1,666	137.9
Unstructured supplementary service data	0.3	207.4	38	268.1
Debit and credit cards at PoS	253.1	-18.6	45,833	-12.2
Prepaid payment instrument (PPI)	87.3	-0.6	2,099	-1.2
Mobile banking	64.9	-7.6	1,20,666	-11.7
<b>Total</b>	<b>922.9</b>	<b>-10.2</b>	<b>98,00,098</b>	<b>-7.0</b>

#### Note

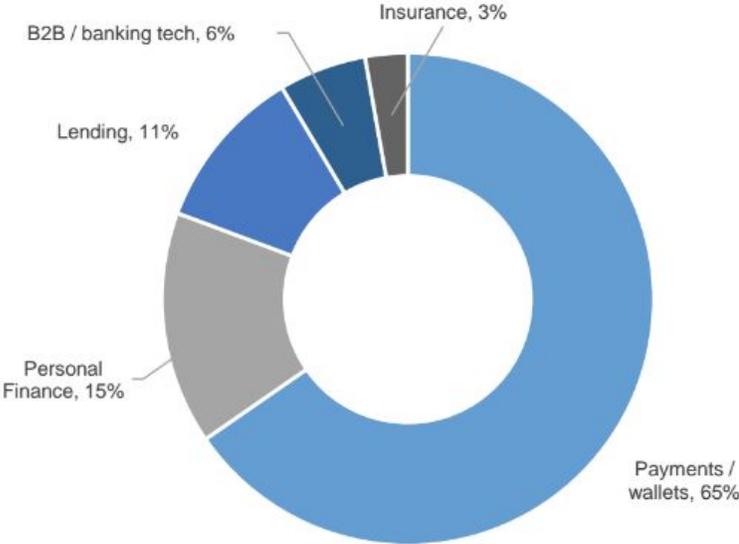
1. Card transactions of four banks. The figures are obtained with a lag of two days, hence, they miss data for January 31
2. PPI issued by eight non-bank issuers for goods and services transactions only
3. Mobile banking figures are taken from five banks

Source: RBI

<sup>57</sup><http://www.livemint.com/Industry/Kmb56uckY49LtZvVnmWSOK/Digital-transactions-peaked-at-Rs1495-t-rillion-in-March-RB.html>

<sup>58</sup>[http://www.business-standard.com/article/economy-policy/numbers-speak-digital-payment-volumes-down-10-reveals-rbi-data-117020601305\\_1.html](http://www.business-standard.com/article/economy-policy/numbers-speak-digital-payment-volumes-down-10-reveals-rbi-data-117020601305_1.html)

Exhibit 2 - Fintech investment by sub -sector (Jan'15 - July'16)<sup>59</sup>



<sup>59</sup> "FinTech in India", Nathan Associates, Jan'17

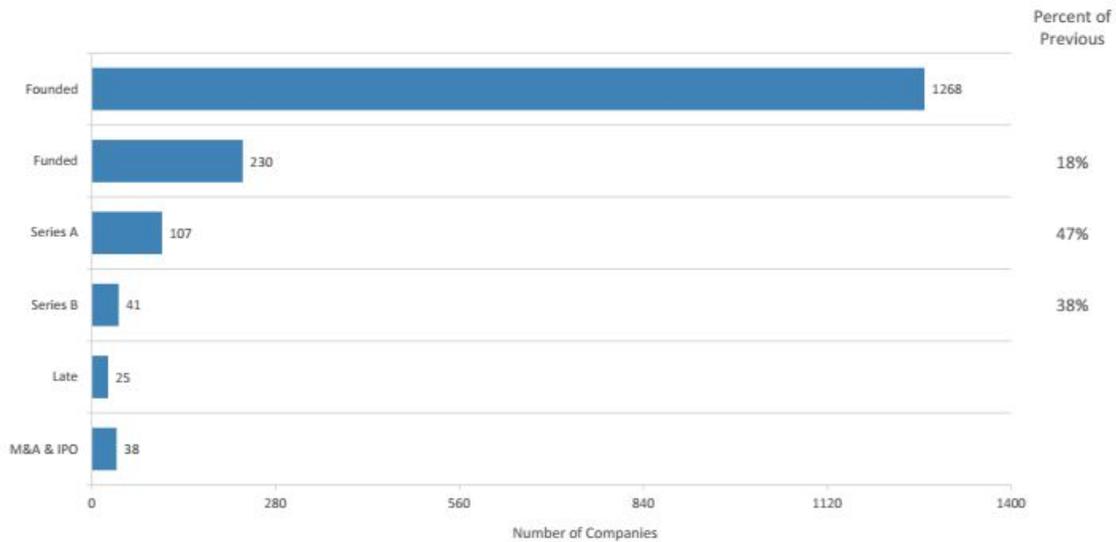
## Exhibit 3 - Fintech companies in India<sup>60</sup>

### THE INDIA FINTECH MARKET MAP 78 PRIVATE COMPANIES AND INITIATIVES EMPOWERING DIGITAL INDIA



<sup>60</sup>[https://www.cbinsights.com/blog/india-fintech-startup-market-map/?utm\\_source=CB+Insights+Newsletter&utm\\_campaign=8cd54ec516-ThursNL\\_4\\_20\\_2017&utm\\_medium=email&utm\\_term=0\\_9dc0513989-8cd54ec516-87110885](https://www.cbinsights.com/blog/india-fintech-startup-market-map/?utm_source=CB+Insights+Newsletter&utm_campaign=8cd54ec516-ThursNL_4_20_2017&utm_medium=email&utm_term=0_9dc0513989-8cd54ec516-87110885)

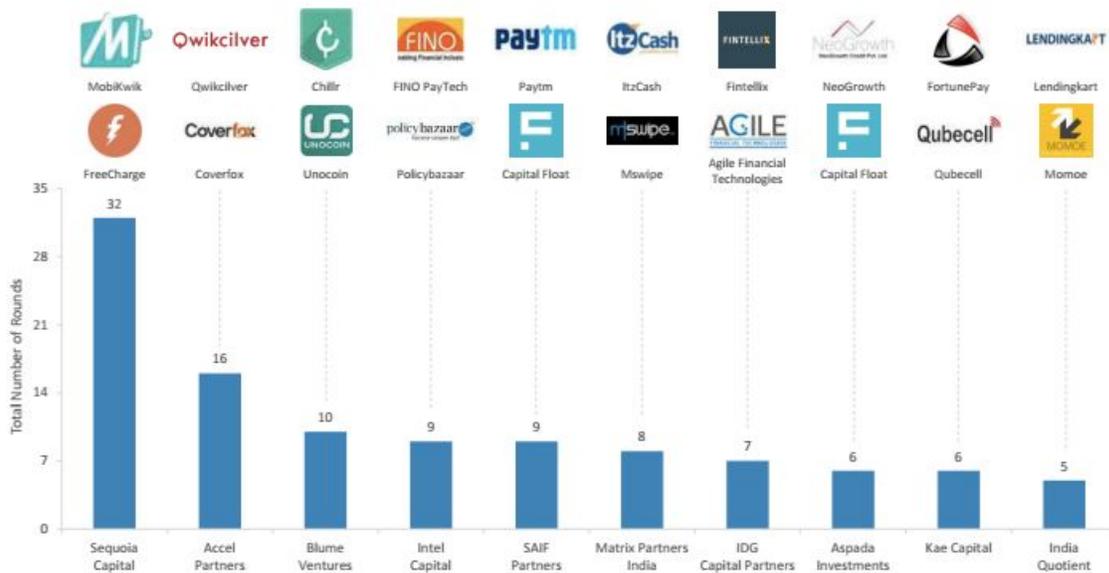
## Exhibit 4 - Funnel view of sector <sup>61</sup>



17 Fintech India Report – October 2016



## Exhibit 5 - Active investors in the sector <sup>62</sup>



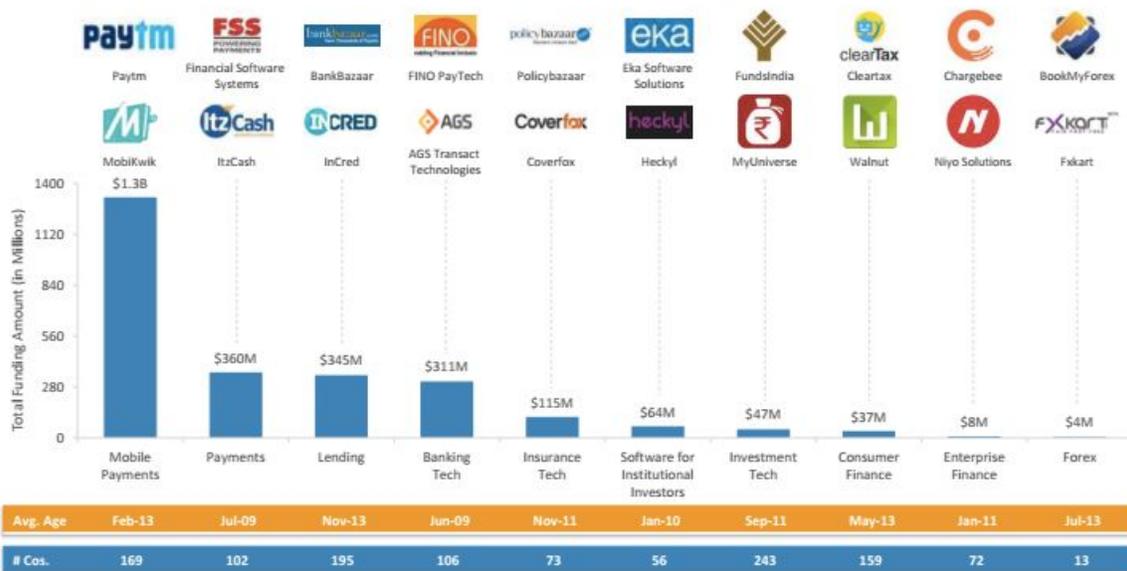
19 Fintech India Report – October 2016



<sup>61</sup> Tracxn, "Fintech India Report", Oct'16.

<sup>62</sup> Tracxn, "Fintech India Report", Oct'16.

## Exhibit 6 - Top Business Models by funding <sup>63</sup>



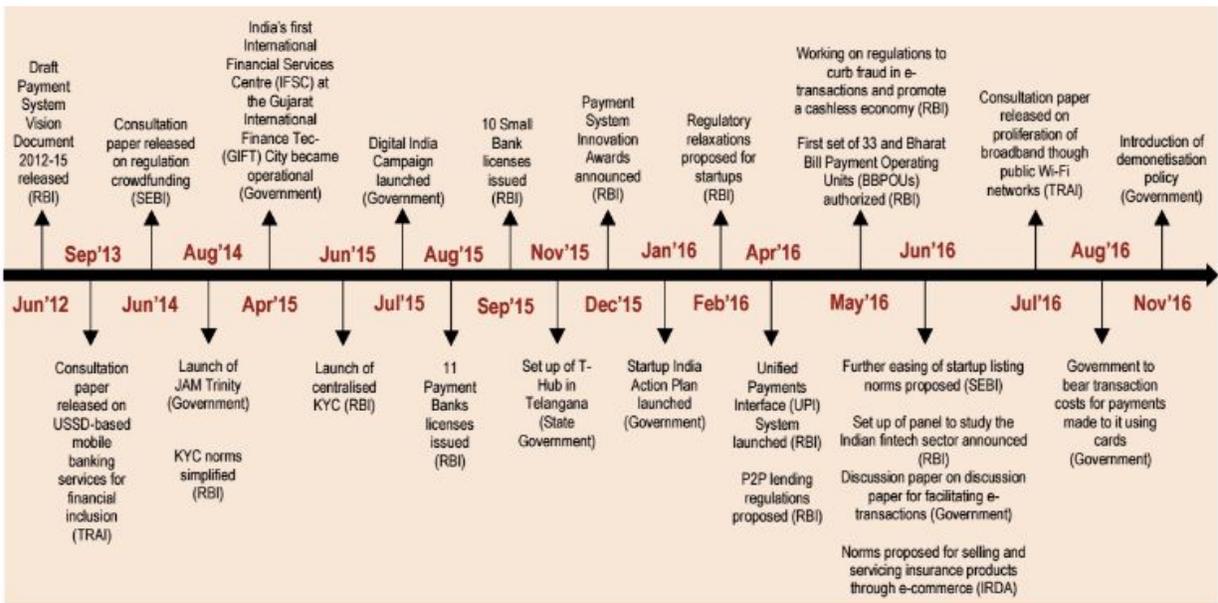
## Exhibit 7 - Government interventions to promote fintech in India <sup>64</sup>

Summary of government interventions to support fintech growth				
Promoting fintech		Creating an enabling environment for fintech		
Encouraging startups	Promoting innovation in finance and tech	Enabling regulations	Improving mobile and Internet usage	Encouraging digital transactions
<ul style="list-style-type: none"> <li>- Startup India</li> <li>- SEBI easing of startup listing norms</li> </ul>	<ul style="list-style-type: none"> <li>- Payment System Innovation Awards (RBI)</li> <li>- Telangana Government's T-Hub</li> </ul>	<ul style="list-style-type: none"> <li>- Licensing of payment banks</li> <li>- RBI upcoming guidelines on P2P</li> <li>- SEBI regulations on crowdfunding</li> </ul>	<ul style="list-style-type: none"> <li>- Digital India campaign</li> <li>- JAM (Adhaar and mobile)</li> <li>- Various TRAI initiatives</li> </ul>	<ul style="list-style-type: none"> <li>- Jan Dhan Yojana</li> <li>- Unified Payments Interface (UPI)</li> <li>- RBI Bharat Bill Payment System</li> </ul>

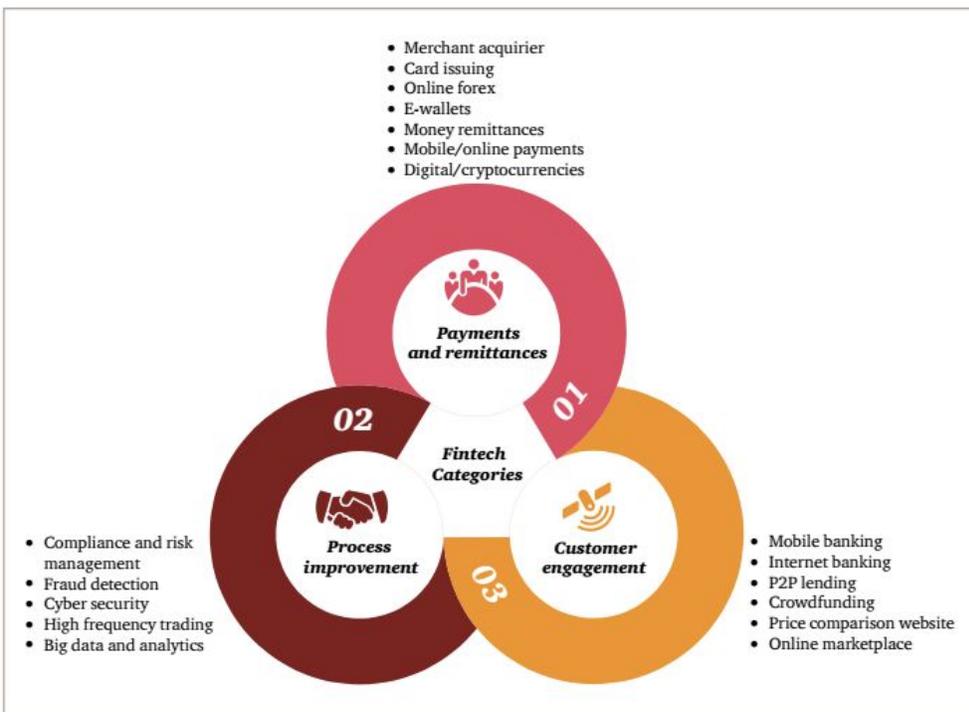
<sup>63</sup> Tracxn, "Fintech India Report", Oct'16.

<sup>64</sup> "FinTech in India", Nathan Associates, Jan'17

## Exhibit 8 - Evolution of regulations governing fintech in India <sup>65</sup>



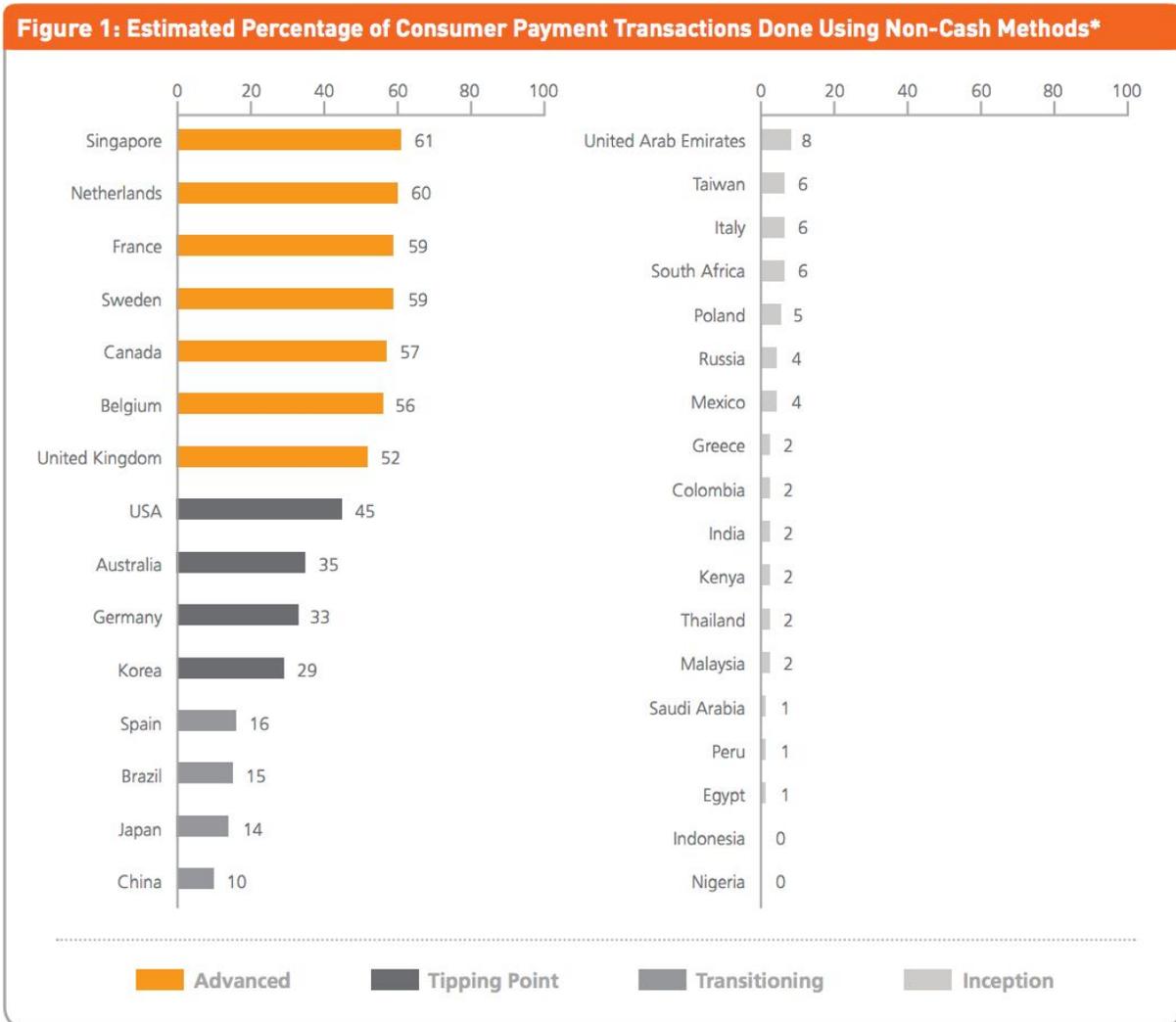
## Exhibit 9 - Various opportunities within fintech sector <sup>66</sup>



<sup>65</sup> "FinTech in India", Nathan Associates, Jan'17

<sup>66</sup> PwC, "Fintech: Redefining banking for customers", CII Banking Tech Summit 2016.

## Exhibit 10 - Percentage of worldwide non-cash transactions



Source: MasterCard Advisors analysis, 2013 | BIS CPSS, 2011 | McKinsey Global Payments Map, 2008 | World Bank, 2011  
 \*Non-cash methods include checks and electronic payments (e.g. cards, ACH)

Exhibit 11 - Consumer transactions in cash across countries

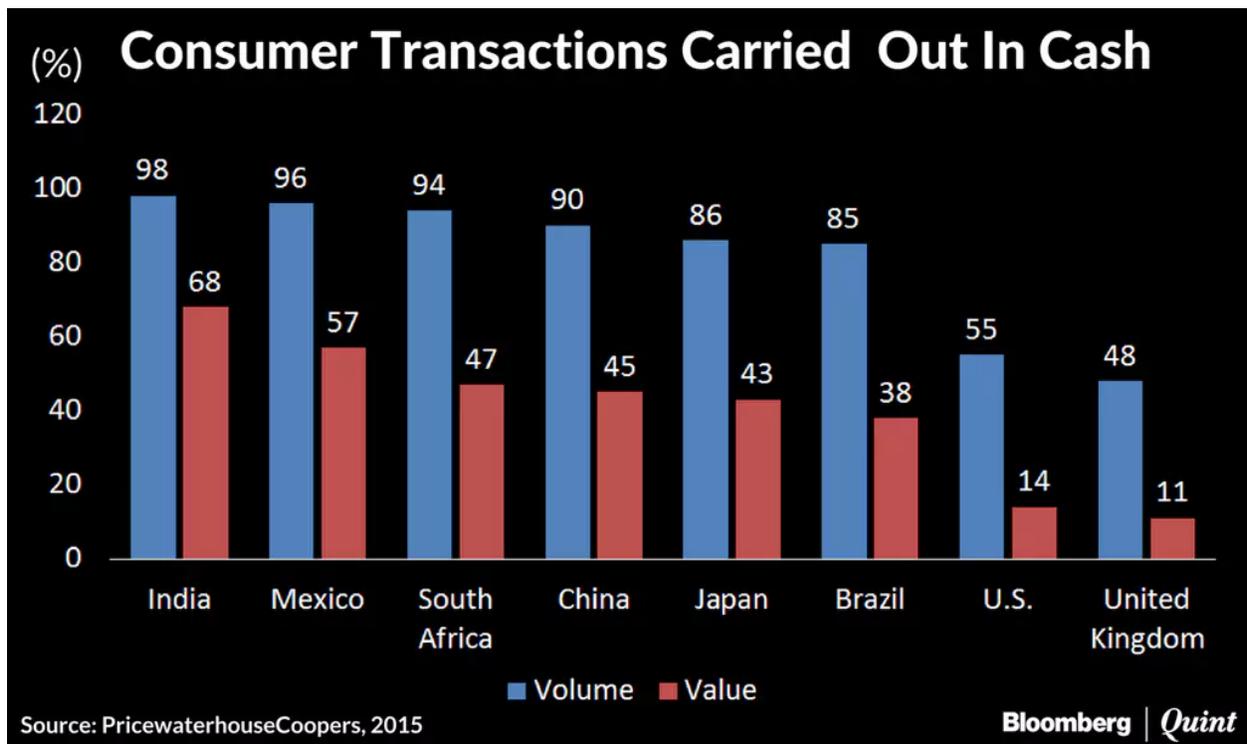
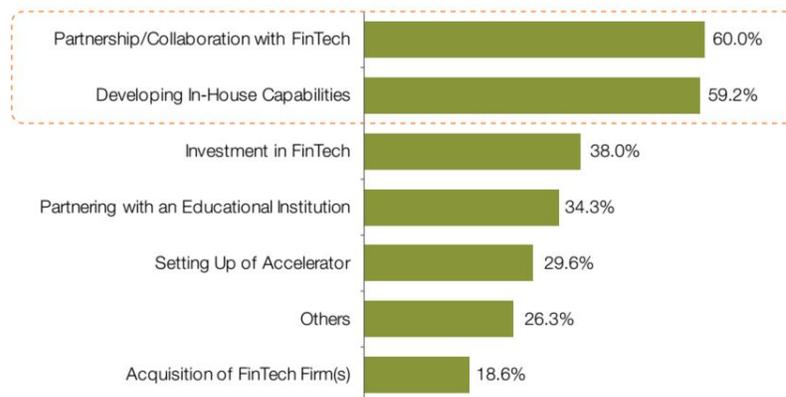


Exhibit 12 - Firms' activeness in various approaches of applying innovation (%), 2016



Note: A firm is considered active if the executive has given the response as 6 or 7 on a 7-point scale

Question: "How active is your firm in the following approaches to applying innovation"?

Source: Capgemini Financial Services Analysis, 2016; Capgemini and LinkedIn WFTR Executive Survey, 2016